

REMARKS

By this amendment, Applicants have amended claims 8, 44 and 45 to correct a clerical error and have amended claim 42 to depend from claim 8. Applicants have also added new claim 46 to define the invention with a claim of differing scope.

Claims 4, 8 and 10-12 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,990,748 to Starck. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a device for receiving PTC elements in a heating device. The device includes an insulating frame having spaced recesses in which the PTC elements can be held and an electrically conductive contact plate held in the insulating frame and on which the PTC elements provided in the recesses of the insulating frame can be placed. According to the present invention, the frame has spaced longitudinal struts extending in a longitudinal direction of the frame and longitudinal spaced cross bars extending perpendicular to the longitudinal struts and linking the longitudinal struts. The struts and cross bars define and surround the spaced recesses. The longitudinal struts of the insulating frame completely and tightly surround most of the length of the longitudinally extending side edges of the contact plate such that the contact plate cannot be drawn out of the insulating frame without damaging the insulating frame.

The Starck patent discloses an apparatus for heating gases, particularly air, with a heating unit having a mounting part, at least one PTC component, at

least one insulating frame part surrounding the latter, at least one contact plate and at least one insulating support. The PTC component is surrounded by the frame part being inserted in the mounting part and on at least one flat side rests a contact plate and is covered by an insulating support.

In Starck, the insulating frame 11 is produced separately from the electrically conductive contact plate 22. The U-shaped clip 18, with its legs 19 and web 21, extend out of the plane described by the longitudinal legs 13 and transverse webs 16 of the actual frame; specifically, the clip 18 is provided in such a way that a finite distance exists between the side of the transverse web 21 of the clip 18 facing the frame and the side of the longitudinal legs 13 and transverse webs 16 of the actual frame facing the transverse web 21, the distance being greater with tolerance than the thickness of the contact plate 22. The same applies to the distance between the two feet 19 of the clip 18 relative to the width of the contact plate 20 (also a greater distance with tolerance). Both elements and, in particular, the required tolerance must be present so that the contact plate may be inserted between the actual frame (determined by longitudinal and transverse legs 13, 16) and the clip web or bracket 21, as is shown in Fig. 2.

The frame 11 and the contact plate 22 are exclusively held by a rivet 24. Thus, it is not correct that the contact plate is “tightly” surrounded by the frame. Rather, it is held more or less loosely by the cross section 21.

From the above, it can be seen that the contact plate does not lie inside the contour defined by the longitudinal and transverse legs 13, 18 of the actual

frame 11; rather, it lies outside of this contour, namely not only below the transverse webs 16, but below the longitudinal legs 13 as well.

Moreover, production is laborious because the additional production step of attachment to the rivet 24 is necessary as well.

In contrast, there is a substantial structural difference between the present invention and Starck described above in that, in the present invention, the contact plate 2 lies inside the height of the contour described by the frame 1, in particular by the longitudinal legs 11, and does not lie outside of or below said contour, as is the case in Starck.

Moreover, as was stated above, according to one aspect of the present invention, the frame is not produced separately and connected to the contact plate only after its physical production; rather, in order to produce the device for accommodating heating elements, the contact plate molded on the frame which, therefore, is at no time a separate physical object. The molding is a method step that is discernible on the finished product (device for receiving PTC elements). This method also achieves an extremely complete and tight connection, a connection by material engagement between the contact plate and the frame in that, during molding, the frame material penetrates into the microstructure (micropores) of the metal. The object may thus be produced in a simpler fashion and is therefore less expensive. Moreover, a substantially better and firmer bond exists between the contact plate and the frame.

The final product is different in both cases, namely the contact plate lying loosely below the actual frame and held by the clips and the rivet in Starck and,

in contrast, a tight bond (by material engagement) between the contact plate and the frame, precisely because of the molding.

While it is possible in Starck to reclaim the contact plate and the frame as separate parts by removing the rivet, it is not possible to do so according to the invention: the insulating frame cannot be removed from the contact plate without damaging it.

Thus, the Starck patent does not disclose a device for receiving PTC elements in which, at least in a limited longitudinal portion of the frame, the contact plate is completely and tightly surrounded by the frame, as set forth in claim 8, or in which the contact frame is frictionally held in the frame so that the contact plate can not be drawn out of the frame without damaging the frame, as recited in claim 39, or in which the contact plate is molded in the frame and, over most of its length, is held in grooves of the frame formed in the longitudinal struts, as recited in claim 42, or in which the contact plate is frictionally held in the frame so that the contact plate can not be drawn out of the frame without damaging the frame and, over most of its length, is held in grooves of the frame formed in longitudinal struts, as recited in claim 43, or in which the contact plate is molded in the frame and, over most of its length, is held in grooves of the frame formed in longitudinal struts, as recited in claim 44, or in which the contact plate is molded in the frame and, at least in a limited longitudinal portion of the frame, the contact plate is completely and tightly surrounded by the frame, as recited in claim 45, or in which the longitudinal struts of the insulating frame completely and tightly surround most of the length of the longitudinally extending side edges of the at

least one electrically conductive contact plate such that the at least one electrically conductive contact can not be drawn out of the insulating frame without damaging the insulating frame, as recited in new claim 46.

For the foregoing reasons, the presently claimed invention is neither anticipated by nor obvious over the Stark patent.

Claims 13, 31, 39 and 42-45 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Starck in view of U.S. Patent No. 6,373,705 to Koelle et al. Applicants traverse this rejection and request reconsideration thereof.

The Examiner has cited the Koelle et al. patent as allegedly disclosing cross-bars that are inwardly directed studs for the positive retention of the PTC elements and a polymer ceramic insulating member used to transfer heat away from a heating component. However, clearly nothing in Koelle et al. would have remedied the basic deficiencies noted above with respect to Starck.

Insofar as the office action asserts with regard to the “bulges” that they are obvious, no prior art is cited. Thus, this allegation is no more than hindsight, which is not permissible.

Accordingly, claims 13, 31, 39 and 42-45 are patentable over the proposed combination of documents, at least for the reasons noted above.

In view of the foregoing amendments and remarks, favorable reconsideration and allowance of all the claims now in the application are requested.

Please charge any shortage in the fees due in connection with the filing of this paper, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit

Account No. 01-2135 (Case: 321.43756X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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